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Gender-Specific Barriers in Female Cardiac Health: Understanding Delayed Care, Late Presentation, and Postmenopausal Risks

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ABSTRACT: *Background:* Cardiovascular diseases (CVDs) are the leading cause of mortality among women, yet gender-specific barriers contribute to delayed care and late presentation, particularly in postmenopausal women. Atypical symptoms, sociocultural factors, and financial constraints further exacerbate disparities in female cardiac health. Understanding these barriers is crucial for improving early diagnosis and treatment. *Objective:* This study aimed to assess gender-specific barriers to cardiac care, focusing on delayed care, late presentation, and postmenopausal risks among female cardiac patients in Khulna, Bangladesh. *Methods:* This cross-sectional study was conducted at the Cardiology Department of Gazi Medical College, Khulna, from April to September 2024. Data were collected from 210 female cardiac patients aged above 45 years using structured questionnaires and medical records. Sociodemographic characteristics, symptom presentation, risk factors, and healthcare-seeking behaviors were analyzed. Statistical analysis included chi-square tests, logistic regression, and p-values to assess significant associations. *Results:* Most participants were aged 55-64 years (40.5%), with 81.9% being postmenopausal. Hypertension (62.9%), diabetes mellitus (54.8%), and obesity (40.0%) were the most prevalent risk factors. Common symptoms included fatigue (81.0%), chest pain (73.3%), and shortness of breath (64.8%), while 22.9% presented with atypical symptoms. Delayed care was observed in 41.9% of cases, significantly associated with postmenopausal status (OR = 2.31, p = 0.014) and atypical symptoms (OR = 3.02, p = 0.002). Financial constraints (32.9%) and symptom misinterpretation (35.2%) were major contributors to delayed presentation. *Conclusion:* Postmenopausal women face significant barriers to timely cardiac care due to financial, sociocultural, and clinical factors. Early screening, awareness programs, and gender-sensitive healthcare policies are essential to addressing these disparities and improving cardiac outcomes in women.

Keywords: Female Cardiac Health, Delayed Care, Postmenopausal Risks, Atypical Symptoms.

INTRODUCTION

Cardiovascular diseases (CVDs) stand as the leading cause of death worldwide, followed by cancer. According to the World Health Organization (WHO) in 2017, approximately 17.9 million people die from CVDs annually, representing 31% of global deaths. CVDs encompass a broad range of conditions including coronary heart disease, cerebrovascular disease, rheumatic heart disease, arterial disease, peripheral arterial disease, congenital heart disease, deep vein thrombosis, and pulmonary embolism. In developed countries, CVD remains the primary cause of morbidity and mortality across both genders. Research has demonstrated that men with low estrogen levels show a correlation with coronary artery disease1, and CVD generally occurs more frequently in men compared to pre-menopausal women [1]. The relationship between menopause and increased CVD risk has led researchers to identify female hormones, particularly estrogens, as cardioprotective agents. These hormones play vital roles in both reproductive and non-reproductive

systems [2]. During menopause, women experience significant changes, including increases in blood pressure, body mass index (BMI), obesity rates, and alterations in body fat distribution [3]. Importantly, estrogens aren't limited to reproductive tissue production - they can also be synthesized in various other tissues including bone, brain, liver, heart, and muscles [4]. Postmenopausal women face significant changes in their cardiovascular risk profile that make them as vulnerable to heart disease as men [5,6]. Several key physiological changes occur during this transition. Women typically experience increases in body weight and changes in how fat is distributed in their bodies, particularly developing more central and visceral fat. These changes are linked to higher rates of cardiovascular disease risk factors, including diabetes [7]. Diabetes poses a particularly serious threat to women's cardiovascular health. A comprehensive meta-analysis examining 37 studies with nearly 450,000 patients found that women with diabetes had a 50% higher relative risk of dying from coronary heart disease compared to men with diabetes [8].

This striking gender disparity in mortality rates stems from several factors: women with diabetes tend to have more severe risk factors, naturally smaller coronary blood vessels, and often receive less optimal diabetes management. As women age and their estrogen levels decline, they typically experience an increase in systolic blood pressure, which is influenced by changes in plasma-renin activity [9-11]. Women over 75 are 14% more likely than men to develop isolated systolic hypertension, which can lead to serious complications including left ventricular hypertrophy, diastolic heart failure, and cerebrovascular disease [12]. While younger women typically have better cholesterol profiles than men, this advantage disappears after menopause. The postmenopausal period brings notable changes in lipid levels, with total cholesterol increasing by 10% and LDL cholesterol rising by 14%, while HDL cholesterol levels remain relatively stable [13]. This makes it crucial for women with borderline cholesterol levels before menopause to have their lipids reassessed after transition. Although women over 65 tend to have higher LDL levels than men, studies show that statin therapy is equally effective at reducing coronary heart disease mortality in both genders [14]. This study investigates the factors contributing to delayed care, late presentation, and postmenopausal risks among female cardiac patients in Khulna, Bangladesh. By analyzing sociodemographic, clinical, and behavioral determinants of delayed healthcare-seeking behavior, this research seeks to generate evidence-based insights for targeted interventions. The findings will be instrumental in guiding healthcare policymakers, clinicians, and public health practitioners in designing gender-sensitive strategies to improve cardiovascular care and reduce mortality among women.

METHODOLOGY

This cross-sectional study was conducted to investigate gender-specific barriers in female cardiac health, with a focus on delayed care, late presentation, and postmenopausal risks. The study was carried out in the Cardiology Department of Gazi Medical College, Khulna, over 6 months, from April to September 2024. A total of 210 female patients, all aged 45 years and above, were included in the study. Participants were selected using a purposive sampling technique to ensure that relevant cases were captured, particularly those who had experienced delays in seeking cardiac care. Data were collected using a structured questionnaire designed to gather comprehensive information on sociodemographic characteristics, clinical history, cardiovascular risk factors, healthcare-seeking behavior, and barriers to timely medical consultation. The questionnaire included both closed and open-ended questions to allow for quantitative and qualitative insights. Additionally, relevant medical records were reviewed to validate self-reported data and ensure accuracy in clinical parameters such as diagnosis, previous treatments, and comorbid conditions. To enhance the reliability of the study, standardized assessment tools were employed.

Cardiovascular risk factors such as hypertension, diabetes, dyslipidemia, and family history of cardiac disease were assessed using validated screening tools. The severity of symptoms and the timeline of healthcare-seeking behavior were documented based on patients' recollections and medical histories. Before participation, all individuals were provided with a detailed explanation of the study's objectives, procedures, potential risks, and benefits. Written informed consent was obtained from each participant, ensuring voluntary participation. Confidentiality and anonymity were strictly maintained by coding patient data and restricting access to personal identifiers. By employing a rigorous methodology, this study aimed to provide a

deeper understanding of the barriers women face in accessing timely cardiac care, ultimately contributing to more effective healthcare interventions and policy recommendations.

RESULTS

Table 1: Sociodemographic Profile of Female Cardiac Patients (n=210)

Variables	Categories	Frequency (n)	Percentage (%)
Age (years)	45-54	78	37.1
	55-64	85	40.5
	≥65	47	22.4
Marital Status	Married	176	83.8
	Widowed	34	16.2
Education Level	No formal education	62	29.5
	Primary	74	35.2
	Secondary	45	21.4
	Higher Secondary & Above	29	13.8
Socioeconomic Status	Low	94	44.8
	Middle	78	37.1
	High	38	18.1

Table 1 shows that the majority of participants (40.5%) were in the 55-64 age group. Most were married (83.8%) and had a low or middle socioeconomic status. Additionally, 64.7% had primary or no formal education, potentially influencing their health literacy and healthcare-seeking behavior.

Table 2: Symptom Profile and Initial Presentation (n=210)

Symptoms	Present	Absent
Chest pain	154 (73.3%)	56 (26.7%)
Shortness of breath	136 (64.8%)	74 (35.2%)
Fatigue	170 (81.0%)	40 (19.0%)
Palpitations	89 (42.4%)	121 (57.6%)
Nausea/vomiting	57 (27.1%)	153 (72.9%)
Atypical symptoms (e.g., back pain)	48 (22.9%)	162 (77.1%)

Table 2 indicates that the most common symptoms were fatigue (81.0%), chest pain (73.3%), and shortness of breath (64.8%). Atypical symptoms, including back pain and nausea, were present in a smaller proportion but significantly impacted healthcare-seeking delays ($p < 0.05$).

Table 3: Distribution of Risk Factors Among Study Participants (n=210)

Risk Factors	Present	Absent	p-value
Hypertension	132 (62.9%)	78 (37.1%)	0.003*
Diabetes Mellitus	115 (54.8%)	95 (45.2%)	0.012*
Dyslipidemia	97 (46.2%)	113 (53.8%)	0.034*
Obesity (BMI > 30)	84 (40.0%)	126 (60.0%)	0.051
Smoking History	23 (11.0%)	187 (89.0%)	0.162
Postmenopausal Status	172 (81.9%)	38 (18.1%)	0.001*

Table 3 shows that postmenopausal status (81.9%), hypertension (62.9%), and diabetes (54.8%) were significant risk factors in female cardiac patients (*p < 0.05*). Smoking was less common but still relevant in this population.

Table 4: Reasons for Delayed Medical Attention (n=210)

Barriers to Seeking Care	Frequency (n)	Percentage (%)
Lack of awareness	88	41.9
Financial constraints	69	32.9
Household responsibilities	49	23.3
Fear of hospital admission	31	14.8
Misinterpretation of symptoms	74	35.2

Table 4 highlights that lack of awareness (41.9%) and financial constraints (32.9%) were the primary reasons for delayed care. Misinterpretation of symptoms, particularly atypical presentations, contributed to 35.2% of delays.

Table 5: Logistic Regression Analysis for Predictors of Delayed Care

Variables	Odds Ratio (OR)	95% CI	p-value
Postmenopausal status	2.31	1.15-3.74	0.014*
Hypertension	1.94	1.12-3.21	0.028*
Low socioeconomic status	2.78	1.45-4.23	0.005*
Atypical symptoms	3.02	1.81-4.97	0.002*

Table 5 presents logistic regression analysis, showing that postmenopausal women (OR = 2.31, p = 0.014) and those from low socioeconomic backgrounds (OR = 2.78, p = 0.005) were significantly more likely to experience delays in seeking medical care. The presence of atypical symptoms (OR = 3.02, p = 0.002) was the strongest predictor of late presentation.

DISCUSSION

The present study aimed to identify the gender-specific barriers in female cardiac health, focusing on delayed care, late presentation, and postmenopausal risks. Conducted in the Cardiology Department of Gazi Medical College, Khulna, this study analyzed data from 210 female cardiac patients aged above 45 years. Our findings reveal critical patterns in sociodemographic factors, clinical presentation, risk factors, and healthcare-seeking behaviors, shedding light on the unique challenges faced by women in accessing timely cardiac care. The majority of participants were aged 55-64 years (40.5%), followed by those aged 45-54 years (37.1%) and ≥65 years (22.4%). These findings align with prior studies showing that cardiovascular disease (CVD) risk escalates with age, particularly after menopause due to hormonal changes and endothelial dysfunction [15]. Most participants were married (83.8%), had no formal or primary education (64.7%), and belonged to low or middle socioeconomic groups (81.9%). Socioeconomic factors significantly impact cardiac health, as seen in studies conducted in Bangladesh and other low-income countries, where financial constraints limit access to preventive care and treatment [16]. Among the participants, the most reported symptoms were fatigue (81.0%), chest pain (73.3%), and shortness of breath (64.8%). However, 22.9% presented with atypical symptoms such as back pain, nausea, and generalized weakness. This aligns with previous studies suggesting that women are more likely to report atypical symptoms than men, leading to misdiagnosis and delays in receiving appropriate treatment [17]. The presence of atypical symptoms was significantly associated with delayed care (p = 0.029), reinforcing findings from a study in India, where 32% of female patients with acute coronary syndrome initially misattributed their symptoms to non-cardiac causes [18].

Hypertension (62.9%), diabetes mellitus (54.8%), and dyslipidemia (46.2%) were the most common risk factors in our study. Notably, postmenopausal women accounted for 81.9% of the total sample, confirming the significant impact of menopause on cardiovascular health. Studies show that postmenopausal women experience a two- to three-fold increase in the risk of CVD due to the loss of estrogen's protective effects [19]. Additionally,

obesity (BMI >30) was prevalent in 40.0% of participants, supporting findings from the Framingham Heart Study, which identified obesity as a major contributor to CVD in women over 5018. A significant proportion of participants (41.9%) delayed seeking care due to lack of awareness, while 32.9% cited financial constraints, and 35.2% misinterpreted symptoms. Household responsibilities also played a role (23.3%), reflecting sociocultural norms that prioritize family duties over personal health. These findings are consistent with a study in Pakistan, where 48% of women delayed seeking care due to similar barriers [20].

Logistic regression analysis further revealed that postmenopausal status (OR = 2.31, p = 0.014) and atypical symptoms (OR = 3.02, p = 0.002) were strong predictors of delayed care. These results are in agreement with a study in the United States, which found that women with non-classical symptoms were 50% more likely to experience delays in receiving emergency cardiac treatment. Our study's findings are consistent with global trends in female cardiac health. For example, a study in the UK found that women with acute myocardial infarction were 34% less likely to receive immediate angioplasty than men, further emphasizing gender disparities in cardiac care [21]. Additionally, research from India and Bangladesh highlights how cultural and social factors contribute to delays in women seeking medical attention for cardiac symptoms [22-36].

Clinical and Public Health Implications
Increased Awareness Campaigns: The high prevalence of delayed care due to symptom misinterpretation and lack of awareness highlights the urgent need for community-based educational programs.
Early Screening for At-Risk Women: Given the high rates of hypertension, diabetes, and obesity, targeted screening for postmenopausal women should be implemented at primary healthcare centers.
Gender-Sensitive Healthcare Policies: The healthcare system should integrate gender-specific approaches in cardiovascular disease prevention and management, ensuring timely diagnosis and treatment for female patients.
Financial Assistance Programs: Since 32.9% of women delayed care due to financial constraints, initiatives like subsidized cardiac checkups and treatment could bridge this gap.

CONCLUSION

This study underscores the gender-specific barriers to cardiac care in women, particularly regarding late presentation and postmenopausal risks. The findings highlight the urgent need for targeted interventions to improve awareness, early diagnosis, and access to care. Future research should explore longitudinal trends in female cardiac health, incorporating larger sample sizes and multi-center data to provide more comprehensive insights.

Conflict of interest: None declared

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